## Section 704. STEEL SHEET PILING AND COFFERDAMS

**704.01 Description.** This work consists of: (A) furnishing and driving permanent steel sheet piling; (B) designing, furnishing, installing, maintaining, and removing temporary steel sheet piling; (C) designing, furnishing, installing, maintaining, and final cut-off for temporary steel sheet piling left-in-place; (D) designing, installing, maintaining, and removing cofferdams; and (E) designing, installing, maintaining, and final cut-off for cofferdams left in place.

**704.02 Materials.** Materials shall meet the following requirements.

Geosynthetics . . . . . 910

Steel sheet piling shall be of the continuous interlock type, either new or used in good condition. Temporary steel sheet piling shall have a minimum nominal section modulus of 18.1 inches cubed per foot of wall. Permanent steel sheet piling section modulus shall be as specified on the plans and furnished with suitable connecting and corner pieces. Cold-rolled sheeting will be permitted for all applications.

**704.03 Construction.**

A. **Design and Installation.** Design, installation, maintenance, and removal of the temporary steel sheet piling, temporary steel sheet piling, left in place, and cofferdams are the responsibility of the Contractor. In accordance with subsection 104.02, the Contractor shall submit a proposed design showing the sheet piling, its section modulus, embedment depth, and bracing to the Engineer for review 10 working days before starting work. Work may begin after the Engineer's acceptance of the sheet pile design. Cutoff elevations will be shown on the plans.

B. **Driving Steel Sheet Piling.** Drive, brace as necessary, and cut off steel sheet piling as specified in subsection 705.03. Drop hammers may be used. Vibratory hammers will be permitted unless otherwise shown on the plans. Do not drive to a greater penetration after casting adjoining concrete. If it is necessary to lower the top of permanent sheet piling after the adjoining concrete has been poured, the excess shall be removed by cutting.

C. **Cofferdams.** Cofferdams shall be a partial or total enclosure which will permit construction of the substructure, above seal or subfooting, in the dry without damage to the work. Alternate methods, used in lieu of cofferdams, will be permitted by authorization only. Such authorization will be considered only after receipt of a Department of Environmental Quality permit for the alternate method.

   The interior dimensions of cofferdams shall provide sufficient clearance for the construction of forms and the inspection of their exteriors, and to permit pumping outside of the forms. Cofferdams or cribs which are tilted or moved laterally during the process of sinking shall be righted or enlarged to provide the necessary clearance. Cofferdams shall not be braced to substructure forms. They shall be constructed to protect the work in place against damage from high water and to prevent injury to the foundation by erosion. No bracing shall extend into or remain in the finished concrete.

When dewatering, pumping shall be done from a sump located outside the forms. When a tremie seal is not called for on the plans, all water pumped from a cofferdam shall be discharged into a geotextile filter bag.

Before placement of a tremie seal, the water level inside the cofferdam shall be maintained equal to the water level outside the cofferdam unless otherwise authorized by the Engineer. After tremie seal placement and initial dewatering into a geotextile filter bag, and where permitted by the Engineer, pumps may outlet clean water directly into the watercourse.

Dewatering shall not begin until the tremie seal has obtained the minimum strength according to subsection 706.03.H.3.

Cofferdams shall be removed in such a manner as not to disturb nor mar the finished concrete.

Cofferdams left in place shall be cut off at the elevation shown on the plans.

**704.04 Measurement and Payment.**

| **Contract Item (Pay Item)** | **Pay Unit** |
|---|---|
| Steel Sheet Piling, Permanent | Square Foot |
| Steel Sheet Piling, Temp | Square Foot |
| Steel Sheet Piling, Temp, Left in Place | Square Foot |
| Cofferdams | Lump Sum |
| Cofferdams, Left in Place | Lump Sum |

A. **Steel Sheet Piling.**

1. Compute **Steel Sheet Piling, Permanent** quantities on the lines and lengths below cutoff shown on the plans or provided by authorization.

2. Compute **Steel Sheet Piling, Temp** and **Steel Sheet Piling, Temp, Left in Place** quantities on the area of required earth retention. The vertical dimension for computing area shall be the difference in ground elevation at the sheeting line or the planned foundation excavation limit at the sheeting line, whichever is less. Unless shown on the plans, the lateral limits will be determined by the design required in subsection 704.03.A.

   Make all horizontal measurements along the sheet piling alignment without allowance for the structural shapes of the separate sections.

   The item **Steel Sheet Piling, Temp** includes designing, furnishing, installing, maintaining, and removing the sheet piling and removing bracing, tie backs, walers, related materials, and equipment required to maintain support of the sheeting and adjacent embankment.

   The item **Steel Sheet Piling, Temp, Left in Place** includes designing, furnishing, installing, maintaining, and cutting off the sheet piling and bracing, tie backs, walers,

related materials, and equipment required to maintain support of the sheeting and adjacent embankment.

B. **Cofferdams.** The item **Cofferdams** includes designing, furnishing, installing, maintaining, and removing cofferdams. When the contract contains a separate item for **Cofferdams**, all cofferdams for the structure will be grouped and measured as a unit. Filter bags will be paid for as specified in subsection 208.04.

The item **Cofferdams, Left in Place** includes designing, furnishing, installing, maintaining, and cut off of the sheet piling. When the contract contains a separate item for **Cofferdams, Left in Place** all cofferdams that are specified as left in place for the structure will be grouped and measured as a unit.

If the contract does not include a separate item for **Cofferdams** or **Cofferdams, Left in Place** for structures not crossing streams, the cost of constructing a cofferdam will be considered to have been included in prices bid for other items of work; for structures crossing streams or encroaching on water courses, the cost of constructing a cofferdam will be paid for as extra work.

If an alternate method to a sheet pile cofferdam is authorized, payment for the alternate method will be made at the contract unit price for **Cofferdams** or **Cofferdams, Left in Place**.